City of San Leandro

Meeting Date: October 7, 2013

Staff Report

File Number: 13-465 **Agenda Section:** CONSENT CALENDAR

Agenda Number: 8.F.

TO: City Council

FROM: Chris Zapata
City Manager

BY: Debbie Pollart
Public Works Director

FINANCE REVIEW: David Baum
Finance Director

TITLE: Staff Report for a Resolution Authorizing the City Manager or His Designee to Execute an On-Bill Financing Loan Agreement with Pacific Gas and Electric Company to Provide 0% Interest Loan Financing and a Rebate Grant Through Participation in the California Wastewater Process Optimization Program

SUMMARY AND RECOMMENDATIONS

Staff recommends that the City Council approve a resolution authorizing the City Manager or his designated representative to sign an On-Bill Financing (OBF) Loan Agreement with PG&E, which allows the energy savings to pay for the capital costs associated with the purchase and installation of an energy efficient turbo blower to replace one of the current aeration blowers.

BACKGROUND

In its treatment operations, the Water Pollution Control Plant (WPCP) is the largest single consumer of electrical energy of all City facilities; the majority of that electricity powers the aeration tank blowers. To comply with the Climate Action Plan mandate to continue to evaluate opportunities to purchase high efficiency equipment, the City contacted the California Wastewater Process Optimization Program (CalPOP) regarding energy efficiency measures that could be implemented to reduce electrical usage. CalPOP provides no-cost engineering services to identify energy savings measures for wastewater treatment plants, while also providing incentives for installations that improve wastewater processes, reduce operating costs and save energy.

Analysis

At the City's request, a CalPOP engineer spent several days in 2011 at the WPCP analyzing Plant processes and data, specifically regarding the operation of the aeration basin. He subsequently prepared a Facility Audit Report (attached). This audit qualifies specific energy efficiency measures for CalPOP incentives.

The Audit's proposed modifications to the Plant would improve control of plant processes, and yield energy and operational cost savings for the Plant. Specifically, the proposals are:

- Replace one existing Lamson 150 HP blower with a high efficiency turbo blower.
- Install a 10 HP fixed speed Sutorbilt positive displacement blower to maintain constant airflow to the offline aeration tank for maintenance of diffuser heads.

These two measures are expected to save the City 276,000 KWh per year with an approximate annual savings of $29,600 in energy costs. CalPOP will also pay the City an estimated one-time rebate of $24,800, which would be returned to the WPCP Enterprise Revenue Fund. The end result will be newer and more efficient plant equipment, secured at no cost to the City.

A Program Participation Agreement (PPA) (attached) was signed in November 2011, which reserves CalPOP incentive funds for the project. It stated that the City intended to move forward with the project, and set terms and conditions for payment of incentives about the project if installed. These incentives will be available only until November 1, 2014.

The Facility Audit was submitted by CalPOP to PG&E to start the process of the OBF Loan. OBF Loan funding from PG&E is a separate but related effort; coordination with PG&E is handled by the CalPOP Program Manager. Loan funding of up to $250,000 at 0% interest is available from PG&E for financing qualified Energy Efficiency projects. The OBF Loan process will utilize the Plant's PG&E bill savings to pay off the loan principal, and the term of the loan is tied to the simple payback period of the project, conservatively estimated to be 6 years; loan payback could be sooner depending on realized energy savings. The City will only temporarily have out-of-pocket capital expenses during project construction, as both the CalPOP rebate incentive and the OBF loan funds will be disbursed upon project completion.

Based on the Facility Audit and the signed Program Participation Agreement, PG&E prepared the OBF Loan Agreement. Once the OBF Loan Agreement is signed by the City Manager, the CalPOP Program Manager will obtain PG&E signatures, at which time the project can begin.

The Audit recommended three different makes of blowers for replacement. After analysis of the capabilities of all three companies, and discussions with the vendors, the Audit Report recommended a single blower as better suited for our application.

Much of the installation will be done by Plant personnel. CalPOP has no limitation or recommendation on the City regarding the use of contractors or equipment purchased. However, significant deviation from the project identified in the Facility Audit may lead to reduced energy savings, and a smaller program incentive. The Plant will secure design and instrumentation contractors and purchase the blowers. Some level of technical assistance and coordination will be available from CalPOP during project installation. Completion of the

project must be no later than November 1, 2014.

Once the project is installed and operating as intended, CalPOP will return to install power monitoring equipment and data loggers in order to prepare an energy savings verification report for submittal to PG&E for approval. CalPOP will also obtain from the City other plant records, reports, project invoices, etc., needed to complete the approvals of project savings. Once approved, the project CalPOP incentive is re-calculated based on actual measured energy savings. The OBF loan terms may be modified to adjust loan terms to match actual project costs, energy and energy cost savings.

CalPOP Incentive and OBF Loan funds are typically disbursed about two months after Project completion.

Current Agency Policies

- Climate Action Plan (adopted by Resolution No. 2009-169 on December 21, 2009 and updated March 1, 2013)

Applicable General Plan Policies

- Policy 28.01 Conservation Advocacy Action 28.01-A: Energy Retrofits of Public Facilities. Pursue the retrofitting of City facilities to improve energy efficiency.
- Policy 52.04 Wastewater Collection and Treatment. Ensure that high operating efficiency is retained in both the wastewater collection and treatment systems.

Fiscal Impacts

This blower retrofit project will temporarily require expenditure of about $200,000, to which staff will take all necessary steps to insure that the entire amount is refunded after installation by the CalPOP incentive and the PG&E loan. The funds were budgeted in Water Pollution Control Plant Fund 593-52-113-5240 for Fiscal Year 2014 to cover design, instrumentation integration, and blower purchase. Installation will be performed by WPCP personnel, saving the City a significant sum in contract labor costs.

Budget Authority

The On-Bill Financing Plus incentive is the most cost effective method to finance this project while meeting City mandates to improve process efficiency.

ATTACHMENTS

- California Wastewater Process Optimization Program Pre-installation Facility Audit Report, San Leandro Wastewater Treatment Facility P1209-533 dated June 30, 2011
- California Wastewater Process Program Participation Agreement signed November 30, 2011
- PG&E Financing Supplement to the Energy Efficiency Retrofit Program Application

- PG&E General On-Bill Financing Loan Agreement

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CALIFORNIA WASTEWATER PROCESS OPTIMIZATION PROGRAM

PRE-INSTALLATION

FACILITY AUDIT REPORT

SAN LEANDRO WASTEWATER TREATMENT FACILITY

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P1209-533
June 30, 2011

CALIFORNIA WASTEWSATER PROCESS OPTIMIZATION PROGRAM (CALPOP)

Facility Audit Report

SAN LEANDRO WASTEWATER TREATMENT FACILITY

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EXECUTIVE SUMMARY

One Energy Efficiency Measure (EEM), a high efficiency aeration blower upgrade (Aeration Blowers EEM), was evaluated at the San Leandro Wastewater Treatment Facility (WWTF), owned and operated by the City of San Leandro. An investment grade audit was performed. The Aeration Blowers EEM showed an attractive simple payback (under six years with incentive). This measure is straightforward, and could be completed in-house in about one year.

Table E1 - San Leandro Energy Efficiency Measure Summary

Energy Efficiency Measure (EEM)	Description	Demand Savings (KW)	Energy Savings (Annual KWh)	Electrical Cost Savings ($/Yr)	EEM Capital Cost ($)	Simple Payback Period (Years)	Incentive Rebate ($)	Adjusted Payback Period (Years)
Aeration Blowers	Turbo, PD Blower Retrofit	10	276,000	$29,600	$195,000	6.6	$25,800	5.7

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DISCLAIMER

California consumers are not obligated to purchase any full-fee service or other service not funded by this program. This program is funded by California utility ratepayers under the auspices of the California Public Utilities Commission (CPUC).

The recommendations in this report assume implementation by facilities personnel familiar with building equipment, and operations and/or contractors experienced in the related fields. The recommendations are not intended to be fully detailed, or standalone instruction sets.

Payback periods are highly dependent on means and methods of implementation. Prices will vary widely depending on whether facility personnel, corporate support personnel or pre-approved contractors are utilized, as well as whether the recommended measures are sent out to bid. We have used historical data, Means Mechanical Cost estimates and experience to arrive at the tabulated figures. In some cases, we have assumed that maintenance personnel will implement the measures recommended, i.e., cogged belt replacement and simple software programming modifications.

INCENTIVES

The incentive amount will be calculated on an aggregate basis for the total retro-commissioning and retrofit energy conservation measures. The incentive amount depends on the percentage of measure implementation. Currently, the calculated incentive amounts are preliminary and subject to change. The program incentive forms will be provided. Incentives for measures, given in cost per kWh, are shown in Table E-1 below.

Table E-1
Measure Incentives †

Energy Efficiency Measure	$/KW (Peak Demand)	$/KWh (First Year Energy)
Aeration Blower	$100	$0.09

† In no case shall the incentive exceed 50% of the installation costs. This incentive cap will be applied on a portfolio basis.

* Definition of Peak Demand, per CPUC developed by DEER, is "*the average grid level impact for a measure between 2:00 p.m. and 5:00 p.m. during the three consecutive weekday periods containing the weekday temperature with the hottest temperature of the year.*"

1. INTRODUCTION

One Energy Efficiency Measure (EEM), a high efficiency aeration blower upgrade (Aeration Blower EEM), was evaluated at the San Leandro Wastewater Treatment Facility (WWTF). This measure was chosen following a walkthrough of the facility, and discussion with facility staff. They have a cogeneration system using digester gas, which can supply approximately 60% of plant load. The facility purchases all remaining electrical power from PG&E, which totaled 3.2 million kWh from May 2010 through April 2011.

1.1 Project Process Overview and Objectives

A technical investigation and investment grade audit was performed for the EEM. The objectives of the study were to establish the soundness of the EEM from both an operational and financial standpoint, and estimate the electrical energy and demand savings that could be expected. The facility maintains blower electrical current, airflow, and aeration system pressure readings on the SCADA (Supervisory Control, Alarm, Data Acquisition) system's historical trending feature. Spot measurements of power and aeration system pressure were made to verify the SCADA readings. The baseline energy demand for the blowers was established for calendar year 2010 based upon hourly SCADA data samples. The process considerations for the EEM involved estimating how much power demand will be reduced from baseline by improving blower efficiency. Energy savings were translated into electrical cost savings.

1.2 General Facility Description

The San Leandro Wastewater Treatment Facility (WWTF) is owned and operated by the City of San Leandro. The WWTF is called H2OWorks. It serves about 50,000 residents, numerous businesses and 22 industrial facilities. It receives the highest concentration of treatable waste of all the major Bay Area WWTF's, as measured by Biochemical Oxygen Demand (BOD). The average daily flow to the WWTF is 5 Million Gallons per Day (MGD), with a design dry weather flow of 7.6 MGD, and wet weather spikes up to 23 MGD. The treatment train provides secondary level treatment with primary clarifiers, a fixed film reactor (trickling filter), aeration basins with fine bubble diffusers, hypochlorite disinfection, and dechlorination. 90% of the treated effluent is discharged to the San Francisco Bay via the East Bay Discharge Authority (EBDA), and the remaining 10% of the effluent is used for commercial irrigation. Secondary biosolids are thickened with polymer and a rotary drum thickener, then combined with primary biosolids and sent to an anaerobic digester. Methane from the anaerobic digester is fed to cogeneration engines, supplying 60% of plant electricity, and 100% of the heat to operate the digesters. The digested biosolids are then dewatered with belt filter presses, and taken to drying beds to produce Class A biosolids.

Figure 1.2.1 provides and aerial view of the San Leandro WWTF and identifies the component operations in the Facility's treatment process.

Figure 1.2.1 -- Aerial View of the San Leandro WWTF

Plant Treatment Components: 1 – Headworks; 2 – Primary Clarifiers; 3 – Fixed Film Reactor; 4 – Aeration Basins; 5 – Secondary Clarifiers; 6 – Disinfection; 7 – Discharge; 8 – Secondary Sludge Thickener; 9 – Anaerobic Digester; 10 – Cogeneration; 11 – Biosolids Dewatering

2. TARGETED PROCESS SYSTEMS AND EQUIPMENT

2.1 Description of Facility and Operational Systems

2.1.1 Aeration Blower Retrofit

Two 659,000 gallon aeration basins are supplied with air by three 150 HP Lamson multistage centrifugal model 867AD blowers, as shown in Figure 2.1.1.1. Only one of the two basins is in operation (online) at any given time; the other is offline in a standby mode. Aeration is accomplished with fine bubble diffusers. The offline basin maintains a water cover over the diffusers, which are usually supplied air to keep the diffusers in operation.

Figure 2.1.1.1 – San Leandro Multistage Aeration Blowers

A single Dissolved Oxygen (DO) sensor supplies the signal to regulate the total amount of air supplied to the online basin. Each basin has four aeration zones, with manually controlled air proportioning valves for each zone. The DO sensor is located in the third zone. All of the existing blowers are constant speed, whereas air supply to the online basin is controlled partially by throttling the blower suction, and additionally venting air to the offline basin. A single blower can supply almost all the aeration demands of the online basin.

The existing multistage blowers have limited turndown capability, and significant energy is wasted by excessive venting to the offline basin when there are low airflow requirements to the online basin. At higher flows, when no excessive air is being vented, the Lamson blowers perform efficiently. Newer blowers on the market have a better turndown capability, and replacing one Lamson blower with a suitable new blower could reduce or avoid excessive venting. In addition, the air required at the offline basin could be supplied much more energy efficiently with a dedicated low pressure blower and additional piping.

2.2 Control Systems

The treatment plant is controlled by Direct Logic 205 Programmable Logic Controllers (PLCs). The operator interface and historical trending system is Citect SCADA software running on IBM PC compatibles.

2.3 Energy Saving Analysis

2.3.1 Aeration Blower Retrofit

The facility SCADA system recorded the entire process data essential to perform the audit for blower replacement: discharge airflow and pressure, electrical current for each blower, and DO. On March 3, 2011, the accuracy of the discharge pressure sensor was verified. On March 17, 2011, at each blower, on-site spot power measurements were made to 1) verify the SCADA current readings were accurate; and 2) establish the power factor of each blower and the ratio of measured current to true power. The individual power factors for each blower were used to convert amperage to power.

To establish an annual airflow demand and power baseline, one hour samples of the SCADA airflow data, blower discharge header pressure, blower current and dissolved oxygen were downloaded as a time sequence table for calendar year 2010. The two aeration basins are called A and B. Each basin has its own automatic air control valve, air distribution manifold, and airflow meter.

The operators switch treatment from one basin to the other periodically. The 2010 airflow data revealed that Tank B was online (used for treatment) from January 1 to April 14 at 12 noon; while Tank A was offline. Tank A was used for treatment for the remainder of 2010 with Tank B offline. Of the Tank A and B air flow signals, the one that periodically drops to zero indicates the air vented to the offline basin. The airflow signal that always has flow indicates the online basin.

The blower discharge pressure sensor was not reading correctly during much of 2010, but as noted above, was verified to be operating correctly by March 2011. Therefore, a three week period of SCADA data, from March 3 to March 17, 2011, was also downloaded using 15 minute intervals to establish the relationship between online basin airflow and system pressure, measured at the blower manifold. The system pressure rises with airflow from increased friction, mainly at the diffusers.

The airflow performance baseline analysis treats the online basin air delivery separately from the air sent to the offline basin, since the recommended measure will have them supplied with different blower systems. The online air will be referred to as process air in the discussion of results. The process air comprises the vast majority of energy required, and is given the most attention in the analysis.

The time sequence 2010 and 2011 blower baseline data was imported into Microsoft Access 2003 for aggregation into airflow bins. The airflow bins were based on process airflow only. The total power of all three blowers was averaged in each airflow bin to establish the baseline power vs. process airflow for the existing Lamson blowers and control system.

To validate the 2010 baseline, the performance of the blowers recorded in the SCADA system was validated against the existing Lamson blower factory curves. They were also compared to a March 3, 2011 spot measurement of flow, power, and discharge pressure with one blower operating at full output. There were two important correlations to validate: 1) the power required vs. airflow and 2) the system pressure required vs. airflow.

The pressure at the aeration blower discharge is critical to estimating the blower power consumption vs. airflow. The blower discharge pressure will be higher than the system pressure measured, due to friction from fittings between the discharge point and the system pressure measurement point. We used a conservative estimate of 1 psig for this friction loss; a well designed piping system should be substantially less, but in a retrofit scenario optimal discharge pipe design is often not feasible.

Vendors of Neuros and ABS turbo blowers and EE-PAC positive displacement blowers provided performance curves for blowers sized to operate over the lower to mid airflow range. Minor adjustments had to be made to each performance curve relation to compare all three blowers under the same operating conditions. These adjustments were either for discharge pressure or inlet temperature. The adjustments were made with the thermodynamic efficiency equation, by keeping the efficiency constant while inputting temperature or pressure adjustments, as well as using the adjusted blower power requirement in the performance estimate.

A Sutorbilt lobe-type constant speed positive displacement blower (PD) was used for performance and cost estimation to supply air to the offline basin. Its energy demand was minor compared to the process air, and a constant discharge pressure was estimated based on a minimal water cover depth,at the airflow preferred by operations staff.

A time of use power baseline cost and savings analysis was done based on June 2011 E19P rate tariff using a monthly billing summary from June 2010 to May 2011 in order to weight the various time-of-use rate periods. From this analysis, a blended energy and demand rate was applied to the 2010 baseline data to determine annual cost savings.

Assumptions in the energy analysis process:

1. The SCADA airflow readings are accurate across the entire range.
2. When one or more existing Lamson blowers are required to supplement the retrofit blower at higher flows, the power required is the same as measured at baseline, smoothed with a regression fit linear relationship.
3. When operated post retrofit, the existing Lamson blowers will maintain the same relationship between system pressure and airflow as the baseline.
4. The system pressure vs. airflow relationship established in March 2011 extrapolates in a linear fashion to airflows above the measured data.
5. There will be a pressure drop of 1 psig between the high efficiency retrofit blower discharge point and the baseline system pressure measurement point, to allow for pipe friction losses.
6. The average ambient temperature is 65 F, for the purposes of estimating blower power consumption.

7. The low pressure blower supplying the offline basin will require no more than 2 psig discharge pressure, including line losses.
8. The maximum process air demand post retrofit will be 400 SCFM less than baseline, as a result of the low pressure blower supplying air to the offline basin. The peak power demand of the post-retrofit process air blower system will be reduced in proportion to the slope of baseline airflow vs. power, in the 4000-7000 SCFM airflow range.
9. The average billing period maximum power demand from the blowers during the baseline year is taken as the average of the peak power readings in each of the twelve calendar months of hourly SCADA samples. The peak period maximum demand is assumed the same as the overall maximum demand.

3. RECOMMENDED ENERGY EFFICIENCY MEASURES

3.1 Summary of Identified Energy Efficiency Measures

Table 3.1.1 provides a energy and economic performance of the identified blower replacement EEM.

Table 3.1.1 – Performance Summary of the Blower Replacement EEM

Energy Efficiency Measure (EEM)	Description	Demand Savings (KW)	Energy Savings (Annual KWh)	Electrical Cost Savings ($/Yr)	EEM Capital Cost ($)	Simple Payback Period (Years)	Incentive Rebate ($)	Adjusted Payback Period (Years)
Aeration Blowers	Turbo, PD Blower Retrofit	10	276,000	$29,600	$195,000	6.6	$25,800	5.7

3.2 Energy Efficiency Measure Description

3.2.1 Aeration Blower Retrofit

The fixed speed Lamson multistage blowers each have a design capacity of 3400 SCFM, where they are reasonably energy efficient for the supply of process air. However, they do not turn down efficiently, and most process airflow demands are well below one blower's design point. The blowers do have suction throttling, the most energy efficient way to reduce the output of multistage blowers. Suction throttling is often limited by blower surge; the point where the blower encounters a compression ratio greater than it was designed for. In the range of 1000-3000 SCFM, a new high efficiency blower with better turndown will reduce energy consumption. The new blower would replace one of the existing Lamsons. It would have almost the same capacity, so there would be minimal loss of spare capacity.

In addition, the air delivery piping system will be modified to allow a new low pressure blower capable of delivering 400 SCFM to supply air to the offline basin, to maintain its diffusers in operation.

Table 3.2.1.1 shows the baseline and estimated post-installation energy and cost parameters used in estimating project energy and cost savings from the blower replacement EEM.

Table 3.2.1.1 Measure Savings Summary

Item	Baseline	Proposed	Savings
Blower System Description	Three 150 HP Multistage Lamson Blowers	One 100 HP Turbo Blower, One 10 HP PD Blower, Two Multistage Lamson Blowers	-
Power Demand KW max	169	159	10
Annual Energy KWh	844,000	568,000	276,000
Blended Demand Charge $/KW	$209	$209	
Blended Energy Charge $/KWh	$0.100	$0.100	
Annual Power Costs	$119,500	$89,900	$29,600

3.2.1.1 Description of Findings

The venting of air to the offline basin is a significant source of energy waste. At the lowest air demands, more air is vented than is used in the treatment process. On average, 24% of the blower discharge was vented to the offline basin in 2010. This vented air is not completely wasted – it keeps the diffusers in the offline basin operational while they are kept covered with a foot or two of water. Operations staff prefer to maintain at least 400 SCFM air flowing through the offline basin. However, the pressure required to supply the air to the offline basin is 1-2 psig, due to the low water level covering the offline diffusers. Using 5+ psig process air and dropping the pressure through a control valve wastes substantial energy, even at the preferred 400 SCFM airflow.

In the analysis that follows, the main focus is on the energy performance of process air supply to the online basin. This serves our intent to propose supplying air to the offline basin from a separate low pressure blower system. To simplify the analysis, we first assume all the baseline energy demand is for process air, and the vented air is simply waste. From an energy standpoint, this is virtually true, since most of the energy imparted to get the air to 5+ psig is lost through the control valve regulating flow to the offline basin.

In Figure 3.2.1.1.1 below, the 2010 baseline process airflow demand and energy performance of the existing aeration system is summarized. The flow frequency peaks at 2000 SCFM, and most airflow demand is below 3500 SCFM. The power demand of the existing blowers is nearly

constant up to 3000 SCFM, then climbs in proportion to process air demand at higher airflows. There are two validation points shown for the energy baseline. The Factory Curves point is the intersection of system pressure and the Lamson factory flow vs. pressure curve, combined with the corresponding point on the factory power vs. flow curve. This indicates the baseline flow and power measurements are in agreement with the stated energy efficiency of the Lamson blowers. Also, a March 3, 2011 spot observation of process airflow and power is in agreement with the 2010 baseline relationship. From these observations, we have confidence the power and airflow measurements are reasonably accurate.

Figure 3.2.1.1.1 – 2010 Baseline Energy Performance and Process Airflow Demand

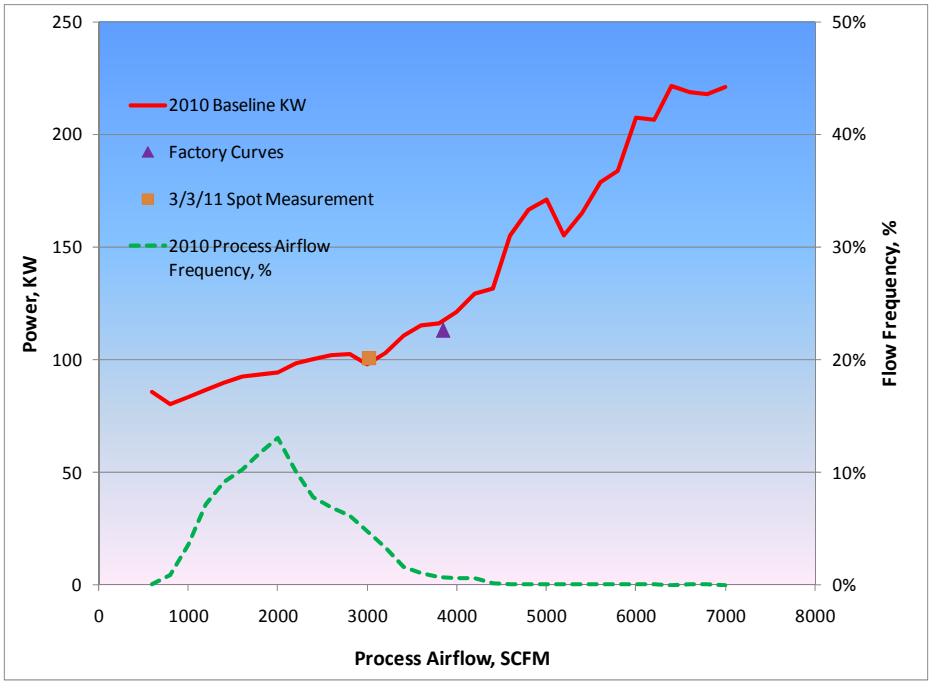
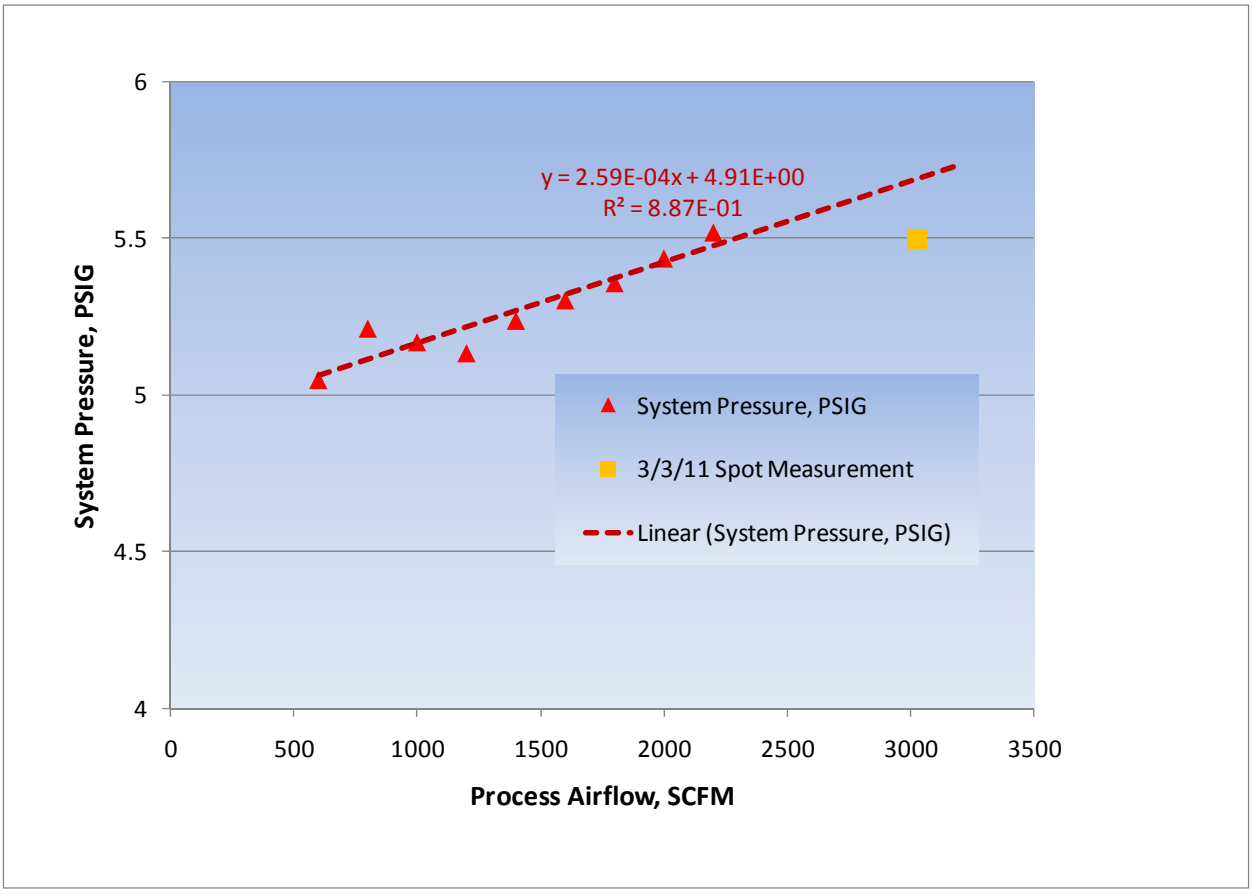


Figure 3.2.1.1.2 shows the relationship between system pressure, measured at the blower manifold, and process airflow bins, as determined during the March 2011 three week study. The airflow during this period was limited to the lower flow range. A linear regression fit of the data resulted in the correlation shown on the figure. This correlation was extrapolated to higher airflows as needed to estimate the system pressure vs. airflow requirements for the retrofit options that were evaluated. The March 3, 2011 spot measurement indicates ~0.2 psig lower actual system pressure than predicted by the extrapolated correlation.

The March 3rd spot measurement also revealed the flow recorded by the SCADA system was considerably less than expected from the factory curves, if the blower were only moving air from atmospheric pressure to system pressure. The blower suction valve was partially closed during the spot measurement, increasing the pressure drop the blower was acting upon, and reducing flow accordingly. Some additional pressure drop, however, will be the result of friction on the discharge side of the blower prior to the pressure measurement at expansion joints and elbows. From the factory curve, the blower pressure differential appears ~2 psi greater than the system pressure spot measurement. For the purpose of estimating the retrofit process air pressure

requirements, we split the apparent 2 psig extra pressure drop between the blower suction valve loss, which will be eliminated for the high efficiency blower and the discharge piping loss, which may remain the same for the high efficiency blower. Stated differently, we add 1 psig to the measured system pressure to estimate the pressure required at the retrofit blower discharge.

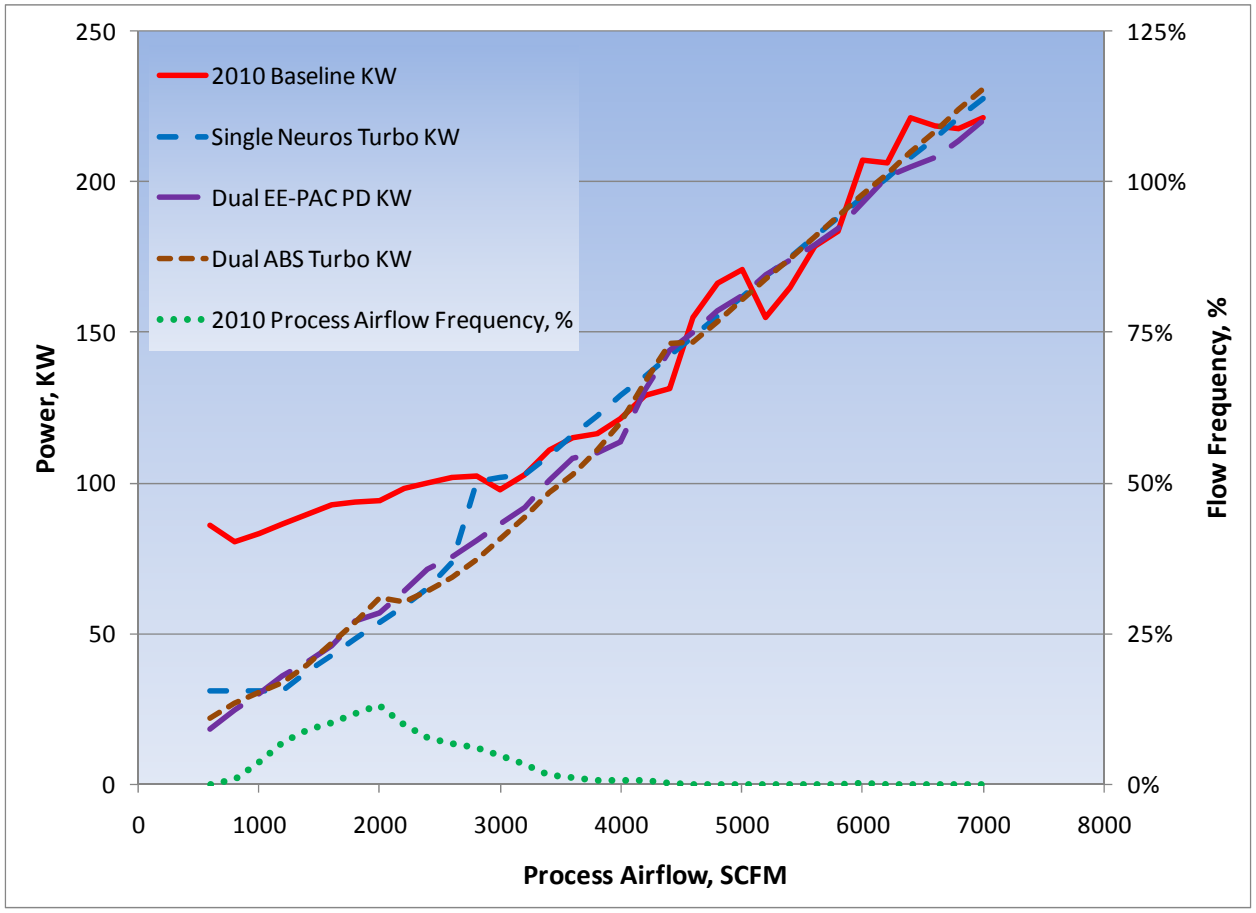
Figure 3.2.1.1.2 – System Pressure vs. Process Airflow



Three types of high efficiency blower systems were evaluated as process air system retrofit candidates: 1) a single 100 HP Neuros turbo blower, 2) dual ABS turbo blowers, at 93 and 200 HP operated sequentially, and 3) dual Universal EE-PAC 60 HP positive displacement lobe type blowers operated separately and in tandem.

Figure 3.2.1.1.3 below compares the energy performance of the three retrofit options supplying air over the 2010 baseline demand range. While there is infrequent demand above 4000 SCFM, we analyzed retrofit performance up to 7000 SCFM to demonstrate the 2010 baseline airflow capacity remains post-retrofit. The high efficiency systems can improve low air demand energy efficiency and be supplemented with the remaining Lamsons to provide high airflow demands, all the way to 7000 SCFM.

Figure 3.2.1.1.3 – Energy Saving Performance of High Efficiency Blower Retrofits



The single Neuros option was sized to handle the flows where the existing Lamsons are least energy efficient, up to 2600 SCFM. The two dual blower options could operate to 4000 SCFM, covering almost all the 2010 baseline airflow demand. All three retrofits offer similar power reductions of up to 2600 SCFM, as shown by their proximity in the figure. The dual blower options continue to perform nominally better than baseline up to 4000 SCFM. At the airflows above 4000 SCFM, the existing Lamson blowers perform adequately. This only represented 1.2% of the airflow demand in 2010; as a result, there is little energy saving incentive to improve efficiency in this high airflow range.

Table 3.2.1.1.1 below shows the annual savings for all three process air retrofit options are close. The turbo blowers (ABS and Neuros) are nominally more energy efficient, and two turbo blowers are better than one. However, the incremental energy savings from the second turbo blower does not justify the added capital cost. Likewise, the higher capital cost of the two positive displacement blowers result in a less attractive payback than the single turbo blower.

The low pressure air supply system for the offline basin will require relatively little energy, due to low airflow and pressure requirements. A constant 400 SCFM will be required at an estimated maximum pressure of 2 psig. A 10 HP fixed speed Sutorbilt positive displacement (PD) blower

is recommended, as it will maintain an almost constant airflow even if the discharge pressure fluctuates, and will require minimal capital cost. A high efficiency blower will not produce significant savings, and few are available at this size. The estimated power demand is 3.6 KW, or 31,900 kWh annually.

Table 3.2.1.1.1 – Energy Usage Summary for Process Air Retrofit Options

Blower Make	Blower Rated HP	Annual Process Air Energy, KWh
ABS	1 - 93 HP, 1 - 200 HP	524,000
APG Neuros	1 - 100 HP	536,000
Universal EE-PAC	2 - 60 HP	539,000

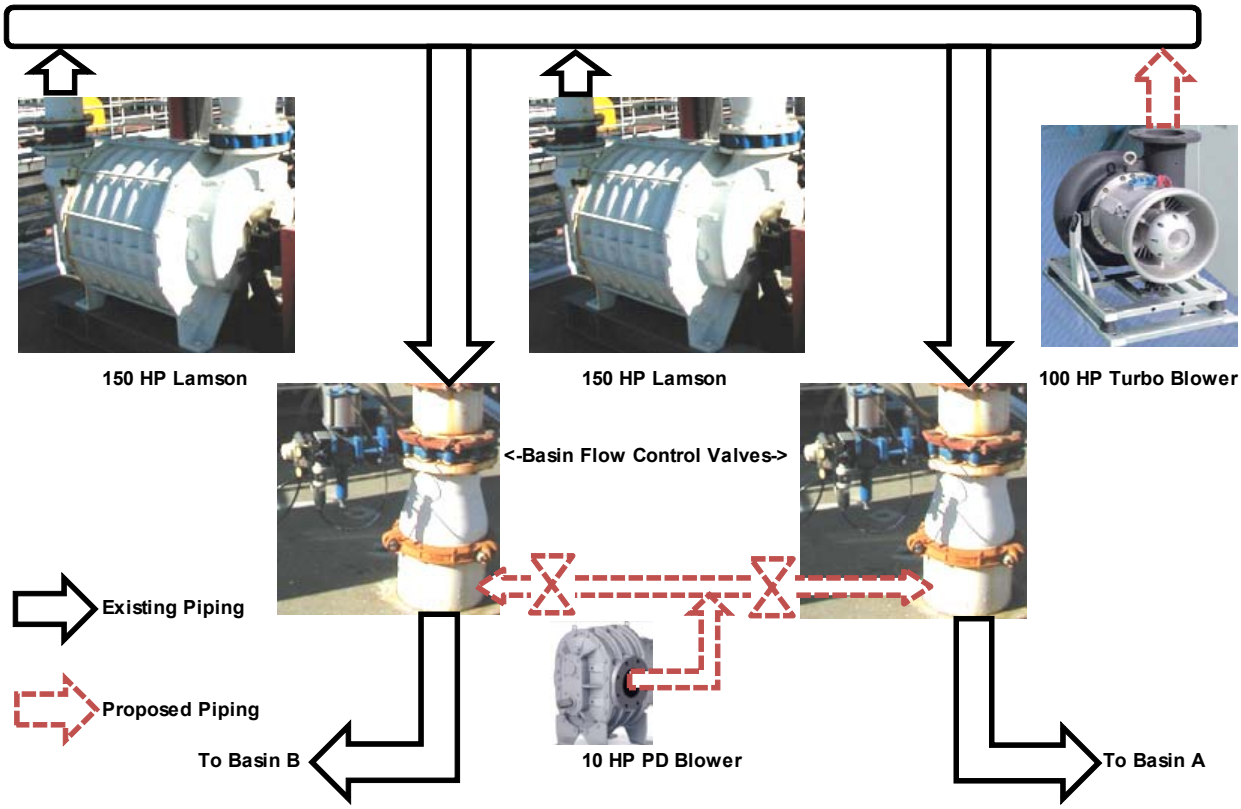
The majority of energy cost savings result from reducing energy (kWh) charges, not demand (KW) charges. However, we do anticipate a minor reduction in peak demand charges for the recommended retrofit, as reflected in Table 3.2.1.1. At the highest baseline process airflows, process air continued to be vented to the offline basin to supply its diffusers, adding to the total blower airflow, and peak power demand. This airflow will be supplied much more efficiently at low pressure if the low pressure blower recommendation is followed. The baseline maximum demand from the blower system was estimated at 169 KW, averaged over the year. The corresponding post retrofit demand estimate is 159 KW, the result of the 400 SCFM reduction in peak airflow for the main blowers, less the added demand of the proposed low pressure PD blower.

3.2.1.2 Scope of Effort to Improve Performance

A single high efficiency turbo blower was determined to be the most cost effective EEM for the process air supply. One of the existing Lamson multistage blowers would be replaced by a high efficiency blower capable of operation below 3000 SCFM. The new blower is expected to use the existing Lamson power supply with minimal modifications. Its controls will have to be integrated with the remaining Lamson blowers, allowing the turbo blower to operate at the lowest airflow demands, then using the Lamsons exclusively above the capacity of the turbo blower. For the occasional flow demands below the minimum of the turbo blower, excess air will need to be vented.

The low pressure air supply to the offline basin will require new piping to intercept the two existing basin air supply manifolds. Figure 3.2.1.2.1 shows the overall air supply schematic. The low pressure supply lines from the PD blower are expected to be 3” diameter, and could be tapped into the existing basin supply lines below the control and isolation valves. Manual valves would be included on each low pressure supply branch to direct the low pressure airflow to the offline basin.

Figure 3.2.1.2.1 – Schematic of Proposed Aeration Air Supply System



We also recommend the Lamson flow controls be reviewed, and if feasible, optimized for peak efficiency at the high airflow rates. As noted in the findings, it appears the suction valve on the Lamson blowers is currently used to restrict flow most of the time. This may be advantageous with the current configuration, but additional energy savings at higher air flows may be possible if the suction valves are optimized for the post retrofit operation.

We further recommend the airflow meters be calibrated prior to final design to verify their accuracy. While they appear to be reasonably accurate, post retrofit energy savings will be improved by accurately sizing the retrofit blower to handle the majority of airflow demands. Also, we recommend verifying pressure losses in the existing blower discharge piping, and estimating discharge losses in the retrofit piping, if substantial changes are made. If the assumptions of accurate airflow or the assumed 1 psig blower discharge friction losses are incorrect, the high efficiency retrofit blower should be optimized for the corrected airflow frequency distribution and/or anticipated discharge pressure range.

Table 3.2.1.2.1 summarizes the capital cost estimation for the retrofit. The largest single component is the turbo blower, which is based on a budgetary vendor quote. The San Leandro staff indicates they would prefer to perform the procurement and installation in-house, so no allowances have been made for bid quality construction documents or contractor margins.

Table 3.2.1.2.1 Capital Cost Summary for the Aeration Blower Retrofit Measure

Lescure Engineers, Inc.

24 Jun 2011 — San Leandro Hi Eff Blower Aeration Retrofit — 10:00:44AM

Level 3 Direct Cost Summary — Tiburon CalPOP Measure Capital Cost Estimate

	Quantity	Unit Cost	Total Cost
11006 San Leandro Hi Eff Blower Aeration Retrofit			
1 HI EFF BLOWER			
02 EXISTING CONDITIONS			
Demolition			$3,000
SUBTOTAL EXISTING CONDITIONS			$3,000
11 EQUIPMENT			
Neuros Blower			$120,000
Low Pressure Blower			$6,000
SUBTOTAL EQUIPMENT			$126,000
26 ELECTRICAL			
Power Delivery			$9,755
Controls			$4,150
SUBTOTAL ELECTRICAL			$13,905
40 PROCESS INTEGRATION			
Mechanical			$17,975
SUBTOTAL PROCESS INTEGRATION			$17,975
SUBTOTAL HI EFF BLOWER			$160,880
SUBTOTAL			*$160,880*
Engineering	10.0%		$16,088
Contingency	10.0%		$17,697
San Leandro Hi Eff Blower Aeration Retrofit			**$194,665**

Table 3.2.1.2.2 summarizes the overall project costs, savings, and simple payback. This project would easily qualify for full funding with a California Energy Commission (CEC) loan. CEC loans have payment terms that allow the energy cost savings to pay off the loan. PG&E is now offering a loan package that also allows the energy savings to pay for the capital cost.

Table 3.2.1.2.2 – Economic Summary of Blower Automation and DO Control Measure

Description	Amount
Project Cost	$195,000
Total Annual Savings	$29,600
Simple Payback (years)	6.6
Energy Savings Rebate Estimate @$0.09/KWHr	$24,800
Demand Savings Rebate @ $100/KW Peak Summer Month	$1,000
Net Project Cost after Rebate	$169,200
Simple Payback (years) after Rebate	5.7

4. SAVINGS AND VERIFICATION PLAN

4.1 Energy Efficiency Projects

Project Level

When the program screening process results in an energy savings estimates at the project level, QuEST will use the following guidelines for determining the level of investigative thoroughness:

Option B: Verification for sites with anticipated savings between 200,000–800,000 kWh

QuEST will provide two weeks of metered data for both pre- and post conditions for the energy efficiency measures that are estimated to be contributing the greatest savings at a site where the estimated savings are between 200,000 and 800,000 kWh. QuEST will provide documentation to support the pre- and post implementation conditions.

Measure Level

When the program screening process results in energy savings estimates at the measure level QuEST will use the following guidelines:

Option B: For measures identified with a savings potential of 75,000 kWh and above

QuEST will provide two weeks of metered data for both pre- and post conditions and will provide documentation to support the pre- and post implementation conditions.

4.2 Retrofit Projects

QuEST will conduct a visual verification of the installation of all retrofit projects and will provide PG&E with digital pictures and invoices for all equipment.

5 CONTACTS, ROLES, AND RESPONSIBILITIES

Effective facility evaluation requires a team effort. The evaluation team for this project included the project owners, the owner's project manager and operating staff, and the CalPOP Program staff. The team members and their contact information for this project are provided below:

Facility Management Staff	**Role**
Laurie Ramirez Water Pollution Control Plant 3000 Davis Street San Leandro, CA 94577 Phone: 510-547-3434 Email: lramirez@sanleandro.org	Lead Operator

CalPOP Program Staff

John Bidwell Quantum Energy Services & Technologies (QuEST) 2001 Addison Street, Suite 300 Berkeley, CA 94704 Phone: (510)-540-7200 Email: jbidwell@quest-world.com	Program Manager
Edward Myers, M.S.Ch.E Lescure Engineers 4635 Old Redwood Highway Santa Rosa, CA, 95403 Phone: 707-575-3427 x 110 Email: ecm@lescure-engineers.com	Project Manager

6 PROJECT SCHEDULE

The proposed schedule for the recommended project is shown in the Table 6.1 below. With prompt approval and sufficient priority, the project should take one year to complete. Loan financing through the California Energy Commission or PG&E could be secured within the time frame indicated between project approval and equipment purchase.

Table 6.1 San Leandro Aeration Blowers Retrofit Proposed Schedule

Item Description	Date
Approve Project and Begin Design	August 2011
Receive Financing, Purchase Equipment	November 2011
Design Completion	December 2011
Receive Equipment	March 2012
Start Construction	April 2012
Construction Completion	May 2012
Commissioning Completion	June 2012
Energy Savings Verification	July 2012

APPENDIX A: MONITORING AND TRENDING PLAN DETAILS

1. Download hourly samples of the SCADA historical data for both basins: airflows and dissolved oxygen
2. Download hourly samples of the SCADA historical data for the blower system: electric current for all 3 blowers, and aeration air supply system pressure
3. Make spot measurements of power and current at all three blowers to establish the conversion for blower current measured in SCADA; Note the time and compare with the SCADA readings for current
4. Install one test quality pressure gauge (0-20 psig, +/- 0.2 psi) in the air supply manifold system pressure measurement point while the air flow is ramped across the normal operating range; Record the corresponding SCADA airflows to establish the air flow vs. pressure system curve

APPENDIX B: UTILITY RATES ANALYSIS

Electricity:
The following rates were downloaded from the PG&E website for schedule E-19P as current for June 2011.

Energy Charges E-19P		
Summer	Peak	$0.14581
	Part Peak	$0.10333
	Off Peak	$0.08611
Winter	Part Peak	$0.09345
	Off Peak	$0.08732

2011 Demand Charges per KW		
Summer	Max. Peak	$12.11
	Part Peak	$2.81
	Maximum	$9.27
Winter	Part Peak	$0.92
	Maximum	$8.07

These rates were applied to the monthly billings of the baseline usage period of calendar year 2010, using the following procedure:

1. The energy and demand rates are multiplied for each month by the actual account usage, and each month summed, so separate energy and demand costs are determined for the year.

2. When a seasonal TOU change occurs in a billing period (typically May 1 and November 1), proportion the energy usage according to the number of billing days in each TOU period.

3. The energy totals (kWh) and maximum demand averages (KW) are determined for the year.

4. A blended energy charge $/kWh is determined (which excludes demand charges).

5. A blended annual demand charge is determined ($/KW) based on the total of all demand charges for the year divided by the average maximum demand.

From these calculations, the following blended demand and energy charges were calculated for use in estimated electrical power cost savings:

Blended Energy Cost	**$**	**0.0996**	**/KWHr**			
Blended Demand Cost	**$**	**209**	**/Yr/KW Avg. Max Demand**			

QUEST
QUANTUM ENERGY SERVICES & TECHNOLOGIES, INC.
2001 Addison Street, Suite 300, Berkeley, California 94704

December 1, 2011

Dean Wilson
Water Pollution Control Division Manager
City of San Leandro
Public Works Department
3000 Davis Street
San Leandro, CA 94577

Dear Dean,

I am returning to you a fully executed copy of the CalPOP Incentive Application that was recently signed by you and the QuEST CFO, Patrick Piette. The attached copy is for your files.

We are looking forward to moving forward with the implementation of this project and we will be coordinating actively with your staff in this effort. Please let me know if you have any questions about this document or any aspect of our ongoing project efforts.

Best Regards,

John L. Bidwell
CalPOP Program Manager
QuEST, Inc.

cc: Adraine Gardner, PG&E

CALIFORNIA WASTEWATER PROCESS OPTIMIZATION PROGRAM
PROGRAM PARTICIPATION AGREEMENT

Facility Management Information (Customer)

City of San Leandro, Public Works Department
MANAGING ORGANIZATION

PG&E SERVICE AGREEMENT ID
(For Program Administration use only)

3000 Davis Street
ADDRESS

San Leandro, CA CITY/STATE **94577** ZIP CODE

Dean Wilson
CONTACT NAME

Water Pollution Control Division Manager
TITLE

(510) 577-6030
PHONE NO.

FAX NO.

dwilson@sanleandro.org
E-MAIL

TAX STATUS (SELECT ONLY ONE)

- ☐ CORPORATION
- ☐ NON-CORP
- ☐ INDIVIDUAL
- ☒ EXEMPT

MUNICIPAL GOVERNMENT
EXEMPTION REASON

TAX IDENTIFICATION TYPE (SELECT AND FILL ONLY ONE)

- ☐ EMPLOYER ID NUMBER (EIN):
- ☒ FEDERAL TAX ID: 94-6022894
- ☐ SSN:

Project Information

City of San Leandro, Water Pollution Control Plant
PROJECT NAME/LOCATION

3000 Davis Street
ADDRESS

San Leandro, CA CITY/STATE **94577** ZIP CODE

Activated Sludge	**7.6**		**0 %**	**221320**	**5/31/2012**
TREATMENT TYPE	AVG. FLOW (MGD)		% CO-GEN USED	NAICS	EST. COMPLETION DATE
0637183621		**0637183005**			
SERVICE ACCOUNT ID (SAID)		**ELECTRIC SERVICE ACCOUNT**		**NATURAL GAS ACCOUNT NUMBER**	

Payment Release Authorization

I am authorizing the payment of my incentive to the party named below, and I understand that I will **not** be receiving the incentive check from QuEST. I also understand and agree that my release of the incentive payment to such party does not exempt me from the incentive requirements outlined in this Application.

Applicant Authorization: (Please Print Name)

Signature

Date

Incentive check should be made payable to:

Payee: Business Name

( ) Telephone Number

( ) Fax Number

Mailing Address

City

State

Zip

Contact Name

Title

E-mail

Program Incentives†

CalPOP Program Measure Incentive (Electric)	**$0.09 / kWh**
CalPOP Program Measure Incentive (Electric)	**$100 / kW ***
CalPOP Program Measure Incentive (Natural Gas)	**$1.00 / Therm**

† In no case shall the incentive exceed 50% of the installation costs. This incentive cap will be applied on a project basis, whereas a project may include multiple energy efficiency measures.

* Definition of Peak Demand, per CPUC developed by DEER, is *"the average grid level impact for a measure between 2:00 p.m. and 5:00 p.m. during the three consecutive weekday periods containing the weekday temperature with the hottest temperature of the year."*

Estimated Energy Savings and Incentives

Energy Efficiency Measures (Refer to project facility audit report or engineering calculations)	**kW**	**kWh**	**Therms**	**Incentive $ Amount**
Hi Efficiency Aeration Blower Retrofit	10	276,000	0	$ 25,840
TOTALS	**10**	**276,000**	**0**	**$ 25,840**

Detailed measure information and associated energy savings, calculations, including baselines for calculated projects and/or minimum efficiency standards as applicable, are described in the Project's Facility Audit Report and/or Engineering Calculations, which are incorporated by reference.

John S. Bidwell
QuEST Reviewer/Engineer Signature

7/20/2011
Date

Estimated Total Incentives (capped at estimated implementation cost):
$ 25,840

TECHNICAL DOCUMENTATION: ☒ Facility Audit Report ☐ Engineering Calculations

CALIFORNIA WASTEWATER PROCESS OPTIMIZATION PROGRAM
PROGRAM PARTICIPATION AGREEMENT

TERMS AND CONDITIONS:

This Agreement is entered into by Quantum Energy Services & Technologies, Inc. (hereafter referred to as "QuEST") and the Customer (as indicated above). This Agreement is a one-time offer from QuEST to provide financial incentives to the Customer for delivering energy savings under the **California Wastewater Process Optimization Program ("Program")** that is funded by California ratepayers under the auspices of the California Public Utilities Commission ("CPUC"). Customer's participation is pursuant to the terms and conditions outlined herein and in the Program Policy and Procedures, which is incorporated by reference. Funding approved for this Program is limited and will be allocated on a first-come, first-served basis to qualified applicants. **Funds will only be reserved upon QuEST's execution of this Agreement.**

This Agreement is valid for one year from the date QuEST executes this Agreement, or the Program end date, December 31, 2012, whichever is sooner. QuEST may extend the valid period of this Agreement at its sole discretion. In no instance shall QuEST pay incentives beyond December 31, 2012. QuEST will deliver an executed copy of this Agreement to the Customer after acceptance and execution by QuEST. QuEST reserves the right to modify or cancel the incentive offer if the actual system(s) installed differs from the proposed installation, or if the Customer's actual installation cost is less than the estimated incentive amount stated above.

QuEST will not use Customer's name or any identifying characteristics of Customer for advertising, sales promotion, or other publicity without prior written approval by Customer. QuEST reserves the right to modify or discontinue this Program without prior notice if such modification or discontinuance is required by PG&E, or by order of the CPUC. Payment of the incentives shall be made to the Customer or Customer's designated payee only after all Program requirements are met, upon verification of installation by a QuEST Program Representative.

ELIGIBILITY:

1. To be eligible for incentives under this Program, Customer's facility must receive electric and/or gas distribution service from PG&E. Customer's facility must be a wastewater treatment facility or associated water reclamation, wastewater collection or distribution systems.
2. Customer must be a PG&E customer who pays Public Purpose Fund charges.
3. To be eligible for incentives under this Program, Customer agrees that Customer will not apply for and has not received incentives offered by another local or state entity or other utilities for the same energy efficiency product, equipment, or services provided under this Agreement. This prohibition applies three years prior to and three years after receiving the incentive(s) for the same product, equipment or service.
4. New products that are ordered purchased and installed prior to January 1, 2010 or after December 15, 2012 do not qualify for an incentive. Products leased, rented, received from warranty or insurance claims, exchanged, or won as a prize do not qualify for an incentive. Resale and rebuilt products qualify for an incentive only with express written approval from QuEST prior to installation.

CUSTOMER AGREES TO:

1. Install and/or implement the energy efficiency measures in accordance with applicable laws, safety standards, and existing governmental regulations or orders.
2. Provide invoices or similar proof of installation costs as required by QuEST and/or PG&E. Proof of installation must include equipment vendor name/address/phone; itemized listing of product including quantity, product description, manufacturer, model number, and other identifying information as appropriate; material and labor costs; date invoice paid or payment terms; and installation date. Incentive amount cannot exceed the installation cost.
3. Provide QuEST with documentation needed to establish the performance of systems or measures selected, and provide QuEST with all documentation needed to verify installation and performance of energy efficient systems or measures qualifying for incentives.
4. Provide manufacturer's specification sheets to QuEST prior to the payment of the incentive.

5. Customer understands that incentives are paid only for energy savings above current applicable federal, state or local codes and standards, or industry standards in the absence of applicable local, state or federal standards. Customer agrees to accept as final authority QuEST's determination of the incentive amount based on the recommendations in the attached Facility Audit Report and the Program Policy and Procedures, a copy of which will be provided to Customer upon request.

6. Allow QuEST, PG&E and CPUC representatives reasonable access to Customer's project site to inspect and verify installation and operation. PG&E's and/or its consultant's review of the design, construction, operation or maintenance of the Project, energy efficiency measures, or demand response measures do not constitute any representation as to the economic or technical feasibility, operational capability, or reliability of the Project measures.

7. To the extent that QuEST is implementing any aspect of the Project on Customer's behalf, Customer understands and agrees that QuEST is solely responsible for ensuring that Project savings are calculated using the appropriate baseline, that the Project is installed according to Customer's specifications and that it will initially deliver the estimated savings described above. QuEST is also responsible for the economic or technical feasibility of the recommended measures to the extent that QuEST receives accurate data regarding the existing equipment or system design and operation from the Customer. QuEST is responsible for the initial operational capability of the energy efficiency measures installed in the Project. However, in the event of any defect in the equipment or in installation(s) performed during the course of this Project by others, Customer shall seek remediation solely from the equipment manufacturer and/or installation contractor(s). Customer shall be responsible for proper maintenance of the installed equipment.

8. Participate in an evaluation, measurement and verification ("EM&V") study, if selected by the CPUC EM&V contractor. These studies are used to analyze current program performance and improve future program designs. Customer agrees to fully cooperate with the study team if asked to participate.

9. Customer understands that incentive payments are based on related energy benefits over the life of the product. Customer agrees that if 1) Customer does not provide PG&E with 100% of the related benefits for the life of the product or a period of 5 years, whichever is less, or 2) Customer ceases to be a distribution customer of PG&E said time period, Customer shall refund a prorated amount of incentive dollars to PG&E based on the actual period of time for which Customer provided the related energy benefits as a Customer of PG&E. Customer will not have to refund a pro-rated amount of the incentive dollars to PG&E due to any change in the ownership of the Facility.

10. If Customer has existing on-site cogeneration or self-generation, QuEST shall not pay incentives for energy savings that exceed the Customer's annual energy usage from PG&E. The annual energy usage shall be determined by the Customer's last 12 months of energy usage as determined from the time that the Customer signed this Agreement. This policy is subject to change with 30-day written notice to the Customer.

11. Customer agrees to not use the QuEST or PG&E name or any identifying characteristics of QuEST or PG&E for advertising, sales promotion, or other publicity without prior written approval by QuEST or PG&E, respectively.

12. If a tenant, Customer is responsible for obtaining the property owner's permission to install the measure(s) for which Customer is applying for an incentive payment. Customer's signature on this application indicates Customer has obtained this permission.

13. Customer is not obligated to purchase any full-fee service or other service not funded by this Program.

TAX LIABILITY:

Incentives may be taxable and will be reported by QuEST to the IRS unless Customer qualifies under an exempt status. QuEST will report the incentive as income to Customer on IRS Form 1099 unless Customer is a corporation or has indicated that it qualifies for an exempt tax status as indicated on this Agreement. Customer is urged to consult a tax advisor concerning the taxability of incentives. Customer is responsible for any taxes that may be imposed as a result of receipt of incentive payments.

QUEST IS RECEIVING FUNDS FROM PG&E FOR THIS PROJECT, BUT QUEST AND CUSTOMER AGREE THAT PG&E IS NOT LIABLE TO EITHER PARTY FOR ANY LOSSES OR DAMAGES, INCLUDING INCIDENTAL OR CONSEQUENTIAL DAMAGES, ARISING FROM THIS AGREEMENT. FURTHERMORE, PG&E MAKES NO REPRESENTATION OR WARRANTY, AND ASSUMES NO LIABILITY WITH RESPECT TO QUALITY, SAFETY, PERFORMANCE, OR OTHER ASPECT OF ANY DESIGN, SYSTEM OR APPLIANCE INSTALLED PURSUANT TO THIS AGREEMENT, AND EXPRESSLY DISCLAIMS ANY SUCH REPRESENTATION, WARRANTY OR LIABILITY.

QUEST AND CUSTOMER (individually, "Party", and collectively "Parties") AGREE:

Each Party shall indemnify the other for any losses or damages arising out of or in connection with the indemnifying Party's actions under the Agreement, except to the extent that the losses or damages arise from a Party's negligence or willful misconduct. NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES.

By execution of this Agreement, Customer certifies that Customer meets all the Program eligibility requirements and that the information supplied on this Agreement is true and correct. Customer certifies that Customer agrees to abide by Program rules and requirements set forth in this Agreement, and that failure of Customer to meet the above obligations may result in the cancellation of this Agreement. To be valid, this Agreement must be signed by all parties prior to November 30, 2012.

California consumers are not obligated to purchase any full-fee service or other service not funded by this Program. This Program is funded by California utility ratepayers under the auspices of the California Public Utilities Commission.

Los consumidores en California no están obligados a comprar servicios completos o adicionales que no esten cubiertos bajo este programa. Este programa está financiado por los usuarios de servicios públicos en California bajo la jurisdicción de la Comisión de Servicios Públicos de California.

In witness whereof, the Parties have executed this Agreement as of the date last set forth below.

CUSTOMER:		**QUEST**	
SIGNATURE		SIGNATURE	
DEAN WILSON		Patrick J. Pope	
CUSTOMER'S REPRESENTATIVE		QUEST REPRESENTATIVE	
WPC MANAGER	11/23/11	CFO	11-30-11
TITLE	DATE	TITLE	DAT

Pacific Gas and Electric Company
Energy Efficiency Retrofit Loan Program

Financing Supplement to the Energy Efficiency Retrofit Program Application

The Energy Efficiency Retrofit Loan Program (the "Program") is funded by California utility customers and administered by Pacific Gas and Electric Company (PG&E) under the auspices of the California Public Utilities Commission (CPUC). The Program provides qualified PG&E customers with a means to finance energy-efficient (EE) retrofit projects implemented under select PG&E EE Programs (the "Qualified Program"). The loans issued under the Program are interest-free, unsecured loans to fully or partially reimburse qualified PG&E customers for the costs they incur in connection with a qualified retrofit project (the "Retrofit Project"), which term shall mean the energy efficiency retrofit project described in Customer's relevant Energy Efficiency Program Application.

Conditions for Eligibility: Participation in the Program is limited to PG&E customers that meet the following conditions and satisfy these conditions throughout the duration of the Retrofit Project up to and including the date of Final Verification (defined below in Section 8): (a) the PG&E customer must be a business ("Commercial Customer") or a federal, state, county or local government agency ("Government Customer").* Commercial Customers and Government Customers are collectively referred to as "Customer;" (b) Customer currently receives service from PG&E at the location of the Retrofit Project (the "Location"); (c) Customer has continually maintained an active PG&E account for the previous 24 months and has a minimum of 12 months of historical metered energy usage at Customer's current Location; (d) at the time the Customer's Program Application is Approved and Customer's Loan Agreement is executed, and at the time the loan is to be funded following completion of the Retrofit Project and satisfaction of all other requirements of the Loan Agreement, Customer must be in good credit standing, as determined by PG&E through credit review which may include a commercial credit check and a bill history review, which may be based upon the following and other criteria:

a. No 24-hour disconnection notices in the last 12 months;

b. No returned payments within the last 12 months;

c. No more than 1 payment arrangement in the last 12 months;

d. No broken payment arrangements within the last 12 months;

e. No deposit assessed within the last 12 months; and

f. The Retrofit Project qualifies and Customer is eligible for an incentive under the Qualified Program.

Loan Amount and Term Limitations	
Interest	0%, with no additional fees or charges
Minimum Loan Amount	$5,000
Maximum Loan Amount	Commercial Customer: $100,000 / premises Government Customer: $250,000 / meter
Maximum Loan Term, not to exceed the Expected Useful Life (EUL) of the measures	Commercial Customer: 60 months Government Customer: 120 months

Loan Features: The loans offered under the Program are interest-free (0%) and free of any fees, late payment penalties or other charges. The loan terms and conditions are set to provide simple payback from energy savings during the maximum allowed loan term, and are calculated by dividing the loan amount (eligible project cost less Qualified Program Incentives) by the estimated monthly energy savings resulting from the Retrofit Project. The ensuing number of monthly payments must not exceed the Maximum Loan Term set forth in chart below ("Loan Amount and Term Limitations").

Eligibility: Prior to purchasing and installing any energy-efficient measures or equipment under the Qualified Program, Customer must satisfy the eligibility requirements of both the Program and Qualified Program. Because energy efficiency projects in progress are ineligible under the Program, Customer must have an inspection of the Retrofit Project and Location conducted and completed by PG&E before commencing any work or purchasing any equipment for the Retrofit Project.

Inspection: PG&E will assist Customers in understanding the energy efficiency measures available under the Qualified Program and will answer their questions concerning this Program. After Customer has decided upon the measures that comprise the Retrofit Project, PG&E will request an engineering review, perform an inspection of the Location, calculate the Loan Terms and prepare the Loan Documents. Thereafter, PG&E will provide Customer with a copy of the inspection report, a Loan Agreement, the Application, the applicable On-Bill Financing (OBF) Gas and/or Electric Rate Schedule and Loan Calculation Summary Sheet (collectively, the "Loan Documents").

Loan Documents: If the terms of the loan are acceptable, Customer shall execute the Loan Documents and return them to PG&E prior to the commencement of the Retrofit Project. Incomplete or incorrect applications cannot be processed and may result in the delay of PG&E's approval and possible disqualification from the Program. Customer may withdraw this Application for any reason without penalty by sending written notice to PG&E.

Customer's Responsibilities for Contractor and Vendor: Upon PG&E's notification to Customer that the Retrofit Project is eligible for the Program, Customer may begin the Retrofit Project pursuant to the contract agreed upon by Customer, its contractor or vendor. PG&E does not endorse or recommend any particular contractor or vendor nor does PG&E review any contractor or vendor proposals. Rather, Customer shall be solely responsible for reviewing the feasibility of the contractor's and vendor's proposal(s) and verifying their respective qualifications, pricing, energy savings, warranties and the terms and conditions of the contractor's and/or vendor's contract with Customer.

*Residential customers are ineligible.

PG&E Disclaimers: CUSTOMER'S DESIGN OF THE RETROFIT PROJECT AND SELECTION AND USE OF ENERGY EFFICIENCY EQUIPMENT, MEASURES AND SELECTION OF CONTRACTORS AND VENDORS IS AT CUSTOMER'S SOLE DISCRETION AND AT CUSTOMER'S SOLE RISK. TO THE EXTENT PERMITTED BY APPLICABLE LAW, PG&E EXPRESSLY AND SPECIFICALLY DISCLAIMS ANY LIABILITY IN RESPECT OF ANY ADVICE, INFORMATION OR OTHER INSTRUCTION PROVIDED BY OR ON BEHALF OF PG&E TO CUSTOMER IN CONNECTION WITH THE QUALIFIED PROGRAM, PROGRAM OR RETROFIT PROJECT. PG&E DOES NOT WARRANT OR BEAR ANY RESPONSIBILITY FOR ANY OF THE FOLLOWING:

a. THE WORK PERFORMED BY CUSTOMER'S CONTRACTOR(S) OR VENDOR(S), THAT THE RETROFIT PROJECT IS APPROPRIATE FOR THE LOCATION;

b. THE RETROFIT WILL RESULT IN OR YIELD ANY ENERGY EFFICIENCY SAVINGS OR A SPECIFIC AMOUNT OF ENERGY EFFICIENCY SAVINGS OR OTHER REDUCTION IN CUSTOMER'S PG&E UTILITY BILL AFTER COMPLETION OF THE RETROFIT PROJECT;

c. THE CONTRACTOR'S OR VENDOR'S SERVICES WILL BE TIMELY, COMPLETE OR ERROR-FREE, OR THAT DEFECTS IN THE RETROFIT PROJECT WILL BE CORRECTED BY SUCH INDIVIDUALS;

d. ANY ERRORS, OMISSIONS, DEFECTS OR DELAYS IN THE DESIGN OR CONSTRUCTION OF THE RETROFIT PROJECT OR THE OPERATION OF ANY ENERGY EFFICIENCY MEASURES INSTALLED AT THE LOCATION.

Verification: Upon completion of the Retrofit Project, Customer shall request PG&E's post-completion inspection and final verification that the Retrofit Project has been completed in conformity with the requirements of the Qualified Program and that customer remains eligible (the "Final Verification").

a. If there has been any change to the Retrofit Project's scope, cost and/or incentives available under the Qualified Program or energy savings, Customer will be required to enter into a Loan Modification Agreement with PG&E, which may include new contract terms reflecting the changes in the Retrofit Project. (If a Loan Modification Agreement is required, it shall be deemed part of the "Loan Documents.")

b. If the changes to the Retrofit Project are such that it no longer meets the Program's payback criteria or other conditions, the Retrofit Project will be considered ineligible, the Loan Agreement will be terminated and no loan proceeds will be disbursed.

c. IF PG&E DETERMINES, IN ITS ABSOLUTE DISCRETION, THAT CUSTOMER'S CREDIT HAS DETERIORATED OR HAS OTHERWISE PLACED CUSTOMER'S REPAYMENT OF THE LOAN AT RISK, THE LOAN PROCEEDS SHALL NOT BE ISSUED, EVEN THOUGH THE RETROFIT PROJECT MAY HAVE BEEN SATISFACTORILY COMPLETED AT CUSTOMER'S EXPENSE.

Disbursements: Subject to and following PG&E's satisfactory Final Verification, an incentive check and the loan proceeds will be issued to Customer or, at Customer's written direction, to Customer's contractor or vendor.

General Provisions:

a. Applications for loans under the Program will be accepted from qualified Customers on a first-come, first-served basis until the funds allocated by PG&E for the Program are no longer available. The Program may be modified or terminated by the CPUC or PG&E at any time and without prior notice. However, termination of the Program following execution of a Loan Agreement by Customer will not affect that Loan Agreement, or, if Customer thereafter satisfies all Program conditions, the disbursement.

b. The loan proceeds may only be used to pay or reimburse Customer for implementing or installing energy-efficient measures or equipment through the Qualified Program.

c. If there is any conflict between the terms of any document relating to the Program, the Loan Documents shall control.

d. For all retrofit projects, including but not limited to streetlight, HVAC and lighting retrofits, Customer acknowledges and understands that Customer is able to use the installation vendor or contractor of their choice.

I have read, understand and agree to all of the Energy Efficiency Retrofit Loan Program requirements and terms and conditions set forth in this Program description. I understand that loan calculations will be based on pre-inspection results and on the applicable program documentation, and that my agency/company must meet all eligibility criteria and requirements in order to participate in the Program. Any unapproved changes to project scope, costs or run hours, or to my agency's/company's creditworthiness, between the time the Loan Documents are accepted and signed and the Retrofit Project is completed and the project's and my agency's/company's continued eligibility are verified, could result in loan ineligibility.

CITY OF SAN LEANDRO	DEAN WILSON
Legal Name of Business (i.e., the formal name on your tax return)	Authorized Representative's Printed Name
Dean Wilson	WR MANAGER 11/25/12
Authorized Representative's Signature	Title Date

Tax identification information (select one):

☒ Federal Tax ID Number: 94-6000421

☐ Social Security Number: _____

FOR PG&E USE ONLY:

PG&E OBF Administrator	Printed Name	Date
Retrofit Program Application Number	OBF Application Number	

Pacific Gas and Electric Company®

GENERAL ON-BILL FINANCING LOAN AGREEMENT

The undersigned customer ("**Customer**") has contracted for the provision of energy efficiency/demand response equipment and services (the "**Work**") which qualify for one or more of PG&E's applicable rebate or incentive programs. Subject to the conditions (including the process for Adjustment and preconditions to funding) set forth below, Pacific Gas & Electric Company (**"PG&E"**) shall extend a loan (the "**Loan**") to Customer in the amount of the loan balance (the "**Loan Balance**") pursuant to the terms of this On-Bill Financing Loan Agreement ("**Loan Agreement**") and PG&E's rate schedules E-OBF and/or G-OBF, as applicable (the "**Schedule**").

To request the Loan, Customer has submitted a completed On-Bill Financing Application and associated documentation as required by PG&E (the "**Application**"). Collectively the Application and this Loan Agreement (including any Adjustment hereunder) comprise the "Agreement".

1. Customer shall arrange for its Contractor, as identified at the end of this Agreement ("**Contractor**"), to provide the Work as described in the Application.

2. The estimated Loan Balance is set forth below. The total cost of the Work as installed, rebate/incentive for qualifying energy efficiency measures, Loan Balance, monthly payment, and loan term specified in this Loan Agreement may be adjusted, if necessary, after the Work and the post-installation inspection described in the Application and/or herein are completed (the "**Adjustment**"). The Adjustment will be calculated using the actual total cost of the Work, as installed, and the estimated energy savings (as described in the Application) of such Work. In no event will the Loan Balance be increased without Customer's written consent, even if Customer is eligible for such increased Loan Balance. Moreover, in no event will the Loan Balance exceed the maximum loan amount stipulated in the Application. Customer understands that in order to be eligible for the Loan, the initial Loan Balance for Work may not fall below the minimum loan amount, nor may the payback period exceed the maximum payback period.

Accordingly, if after the Adjustment, the Loan Balance falls below the minimum loan amount or if the simple payback period exceeds the program maximum payback period, each as described in the Application, PG&E shall have no obligation to extend the Loan, as the Work would not meet program requirements. The Adjustment described in this paragraph will be communicated to the Customer in writing and will automatically become part of this Loan Agreement, except that any proposed increase in the Loan Balance will only become part of this Loan Agreement upon Customer's written consent to such increase.

3. PG&E shall have no liability in connection with, and makes no warranties, expressed or implied, regarding the Work. Customer will be responsible for any and all losses and damage it may suffer in connection with, and any claims by third parties resulting from, the Work. Customer shall indemnify and hold harmless PG&E, its affiliates, and their respective owners, officers, directors, employees and agents thereof, from and against all claims, demands, liabilities, damages, fines, settlements or judgments which arise from or are caused by (a) any breach of the Agreement by Customer; (b) any defects or problems with the Work, or the failure of the Work to deliver any anticipated energy efficiencies; (c) Customer's failure to pay any amount due or claimed by Contractor with respect to the Work; or (d) the wrongful or negligent acts or omissions of any party (including Contractor) in the conduct or performance of the Work.

4. Customer represents and warrants that (a) Customer is receiving this Loan solely for Work obtained in connection with Customer's business, and not for personal, family or household purposes; (b) Customer, if not an individual or a government agency, is duly organized, validly existing and in good standing under the laws of its state of formation, and has full power and authority to enter into this Agreement and to carry out the provisions of this Agreement. Customer is duly qualified and in good standing to do business in all jurisdictions where such qualification is required; (c) this Loan Agreement has been duly authorized by all necessary proceedings, has been duly executed and delivered by Customer and is a valid and legally binding agreement of Customer duly enforceable in accordance with its terms;
(d) no consent, approval, authorization, order, registration or qualification of or with any court or regulatory authority or other governmental body having jurisdiction over Customer is required for, and the absence of which would adversely affect, the legal and valid execution and delivery of this Loan Agreement, and the performance of the transactions contemplated by this Loan Agreement; (e) the execution and delivery of this Loan Agreement by Customer hereunder and the compliance by Customer with all provisions of this Loan Agreement: (i) will not conflict with or violate any Applicable Law; and (ii) will not conflict with or result in a breach of or default under any of the terms or provisions of any loan agreement or other contract or agreement under which Customer is an obligor or by which its property is bound; and (f) all factual information furnished by Customer to PG&E in the Application and pursuant to this Agreement is true and accurate.

5. The Application must include the Federal Tax Identification Number or Social Security Number of the party who will be the recipient of the checks for the rebate/incentive or any Loan proceeds. Checks may be issued directly to the Customer or its designated Contractor or both, for the benefit of the Customer, as specified below. Customer acknowledges that PG&E will not be responsible for any tax liability imposed on the Customer or its contractor in connection with the transactions contemplated under the Agreement, whether by virtue of the Loan contemplated under the Agreement, or otherwise, and Customer shall indemnify PG&E for any tax liability imposed upon PG&E as a result of the transactions contemplated under the Agreement.

6. Upon completion of the Work, Customer shall send a written confirmation of completion to PG&E's On-Bill Financing Program Administrator at the address listed in Section 15. Within 60 days after receiving the confirmation, PG&E (a) will conduct a post installation inspection and project verification, including review of invoices, receipts and other documents as required by PG&E to verify the correctness of any amounts claimed by Customer; (b) will adjust, if necessary, the total cost, incentive, Loan Balance, monthly payment, and loan term as stated above; and (c) if PG&E deems necessary, obtain updated financial information to verify that Customer has good credit standing (as determined by PG&E) prior to making the Loan. Customer shall give PG&E reasonable access to its premises and the Work and shall provide such updated financial information to PG&E upon request. PG&E may decline to make the Loan if PG&E determines, in its sole discretion, that Customer does not have good credit standing at that time.

If the Work conforms to all requirements of the Agreement and all amounts claimed by Customer as Work costs are substantiated to PG&E's reasonable satisfaction, and PG&E is satisfied that Customer has good credit standing, PG&E will issue a check ("**Check**") to Customer or Contractor (as designated by Customer in Section 15) for all amounts PG&E approves for payment in accordance with the Agreement. The date of such issuance is the "**Issuance Date**". If the Check is issued to Customer, Customer shall be responsible for paying any outstanding fees due to Contractor for the Work. If the Check is less than the amount due from Customer to Contractor, Customer shall be responsible for the excess due to the Contractor.

7. Customer shall repay the Loan Balance to PG&E as provided in this Loan Agreement irrespective of whether or when the Work is completed, or whether the Work is in any way defective or deficient, and whether or not the Work delivers energy efficiency savings to Customer.

8. The monthly payments will be included by PG&E on the Account's regular energy service bills, or by separate bill, in PG&E's discretion. Regardless whether the monthly payments are included in the regular utility bill or a separate loan installment bill, the following repayment terms will apply:

a. The Customer agrees to repay to PG&E the Loan Balance in the number of payments listed below and in equal installments (with the final installment adjusted to account for rounding), by the due date set forth in each PG&E utility bill or loan installment bill rendered in connection with Customer's account (identified by the number set forth below) ("Account"), commencing with the bill which has a due date falling at least 30 days after the Issuance Date.

b. If separate energy service bills and loan installment bills are provided, amounts due under this Loan Agreement as shown in the loan installment bill shall be deemed to be amounts due under each energy services bill to the Account, and a default under this Loan Agreement shall be treated as a default under the Account.

c. If the Customer is unable to make a full utility bill payment in a given month, payment arrangements may be made at PG&E's discretion.

d. Any partial bill payments received for a month will be applied in equal proportion to the energy charges and the loan obligation for that month, and the Customer may be considered in default of both the energy bill and the loan installment bill.

e. Further payment details are set forth below.

9. Any notice from PG&E to Customer regarding the Program or the transactions contemplated under the Loan Agreement may be provided within a PG&E utility bill or loan installment bill, and any such notices may also be provided to Customer at the address below or to the Customer's billing address of record in PG&E's customer billing system from time to time, and in each case shall be effective five (5) days after they have been mailed.

10. The Loan Balance shall not bear interest.

11. Customer may, without prepayment penalty, pay the entire outstanding loan balance in one lump sum payment provided the customer first notifies PG&E by telephoning the toll free phone number (1-800-468-4743), and by sending written notice to PG&E On-Bill Financing Program Administrator at the address listed below, in advance of making the lump sum payment. Accelerated payments that are received from Customer without PG&E's prior approval may, at PG&E's sole discretion, be applied proportionally to subsequent energy charges and Loan repayments and PG&E shall have no obligation to apply accelerated payments exclusively to reduction of the outstanding Loan.

12. The entire outstanding Loan Balance will become immediately due and payable, and shall be paid by Customer within 30 days if: (i) the Account is closed or terminated for any reason; (ii) Customer defaults under the Agreement; (iii) Customer sells or transfers ownership of the equipment forming part of the Work to any third party (including as part of a sale or lease of premises or transfer of business or otherwise); or (iv) Customer becomes Insolvent. Customer becomes "Insolvent" if: (i) Customer is unable to pay its debts as they become due or otherwise becomes insolvent, makes a general assignment for the benefit of its creditors, or suffers or permits the appointment of a receiver for its business or assets or otherwise ceases to conduct business in the normal course; or (ii) any proceeding is commenced by or against Customer under any bankruptcy or insolvency law that is not dismissed or stayed within 45 days.

13. Customer understands that without limiting any other remedy available to PG&E against Contractor or Customer, **failure to repay the Loan Balance in accordance with the terms of the Agreement could result in shut-off of utility energy service, adverse credit reporting, and collection procedures, including, without limitation, legal action**.

14. If there is any conflict among the documents comprising the Agreement, the following order of priority shall apply: 1. this Loan Agreement; 2. the Application; 3. any documents attached to the Application.

Pacific Gas and Electric Company®

15. Loan Particulars.

This table is to be completed by PG&E					
Total Cost	**Incentive**	**Loan Balance [1]**	**Monthly Payment**	**Term [2] (months)**	**Number of Payments**
$ 195,000.00	**$ 25,800.00**	**$ 169,200.00**	**$ 2,820.00**	**60**	**60**

Check Made Payable to Customer □ or Contractor □
[customer to select payment method. Note that only one check can be issued]

Customer Details	**Contractor Details**
Federal Tax ID or Social Security #, Customer	Federal Tax ID or Social Security #, Contractor
94-6000421	

PG&E Account # / Service Agreement #
Acct: 0637183621 SAID: 0637183005

Account Name, Customer	Name, Contractor
City of San Leandro (QuEST-CalPOP Wastewater Retrofit #CAPOP-036)	

Service Address, Customer	Address, Contractor
3000 Davis Street, San Leandro, CA 94577	

Name and Title of Authorized Representative of Customer	Name and Title of Authorized Representative of Contractor

Signature of Authorized Representative of Customer

Date

ACCEPTED: Pacific Gas & Electric Company

By	Date
PG&E On-Bill Financing Program Manager	

Address:

PG&E Integrated Processing Center
P.O. Box 7265
San Francisco, CA 94120-7265

[1] The Loan Balance shall not exceed one-hundred thousand dollars ($100,000) for commercial customers and shall not exceed two-hundred fifty thousand dollars ($250,000) for government agency customers, excepting loans to government agency customers where, in PG&E's sole opinion, the opportunity for uniquely large energy savings exist, in which case the Loan Balance may exceed two-hundred fifty thousand dollars ($250,000) but shall not exceed one million dollars ($1,000,000).

[2] Commercial loans may have their loan terms extended beyond five years, not to exceed the expected useful life (EUL) of the bundle of energy efficiency measures proposed, when credit and risk factors support this.

ENERGY EFFICIENCY RETROFIT LOAN PROGRAM (OBF)
Loan Calculation Summary Sheet
Simple project payback per meter

Customer Name: City of San Leandro

Project Number: QuEST-CalPOP Wastewater Retrofit #CAPOP-036

Pre-Field: Revised 9/23/2013

(A) PROJECT COST FOR MEASURES	(B) REBATES or INCENTIVES	Customer Down Payment or Buy-Down	CUSTOMER TOTAL LOAN AMOUNT	(C) CUSTOMER AVERAGE RATE *PER kWh*	(D) CUSTOMER AVERAGE RATE *PER Therm*	(E) ESTIMATED ANNUAL ENERGY SAVINGS *(kWh)*	(F) ESTIMATED ANNUAL GAS SAVINGS *(Therm)*	ESTIMATED ANNUAL ENERGY COST SAVINGS	SIMPLE PAYBACK IN YEARS
$ 195,000.00	$ 25,800.00		$ 169,200.00	$ 0.124	$ -	276,000.0	0.0	$ 34,224.00	4.94

PAYBACK IN MONTHS BASED ON EXPECTED ENERGY SAVINGS	LOAN TERM (MONTHS) (1 month added for bill neutraility)	CUSTOMER FIXED MONTHLY LOAN PAYMENT	EXPECTED MONTHLY ENERGY SAVINGS
59	60	$ 2,820.00	$ 2,852.00

(C) = (From utility bill) Total $ amount (12-month) / Total kWh (same 12-month)
(D) = (From utility bill) Total $ amount (12-month) / Total therm (same 12-month)

City of San Leandro

Meeting Date: October 7, 2013

Resolution - Council

File Number: 13-467 **Agenda Section:** CONSENT CALENDAR

Agenda Number:

TO: City Council

FROM: Chris Zapata
City Manager

BY: Debbie Pollart
Public Works Director

FINANCE REVIEW: David Baum
Finance Director

TITLE: ADOPT: Resolution Authorizing the City Manager or His Designee to Execute an On-Bill Financing Loan Agreement with Pacific Gas and Electric Company (provides 0% interest loan financing for a California Wastewater Process Optimization Program qualified Energy Efficiency Project)

WHEREAS, an On-Bill Financing Loan Agreement between the City of San Leandro and Pacific Gas and Electric Company has been presented to this City Council; and

WHEREAS, the City Council is familiar with the contents thereof; and

WHEREAS, the City Manager has recommended approval of said agreement.

NOW, THEREFORE, the City Council of the City of San Leandro does RESOLVE as follows:

1. That said agreement substantially in the form presented is hereby approved and execution by the City Manager or his designee is hereby authorized; and

2. That the City Manager is authorized to make non-substantial revisions to said agreement, subject to the approval of the City Attorney; and

3. That an original executed agreement shall be attached to and made a part of this resolution.